SYNTHESIS

JBL

SYNTHESIS
S5160/230
POWER
AMPLIFIER
USER'S
MANUAL

JBL SYNTHESIS

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JBL Synthesis S5160/230 Power Amplifier
User's Manual

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1.1 Important Safeguards For Audio Products

PLEASE READ CAREFULLY ALL THE FOLLOWING IMPORTANT SAFEGUARDS THAT ARE APPLICABLE TO YOUR EQUIPMENT

CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: To reduce the risk of electric shock, do not remove cover (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.

CAUTION: To prevent electric shock, do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

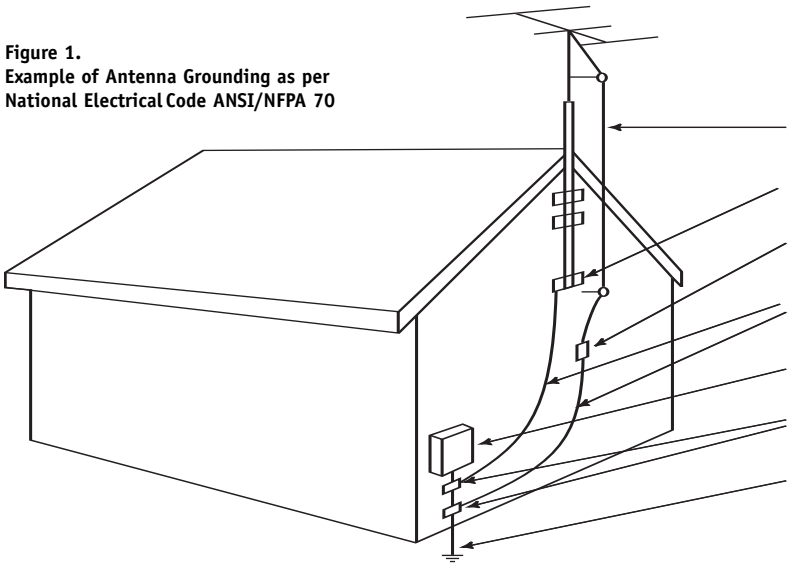
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Do not use attachments not recommended by the product manufacturer, as they may cause hazards.
16. This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.
17. If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure 1.

18. An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits, as contact with them might be fatal.
19. Do not overload wall outlets, extension cords, or integral convenience receptacles, as this can result in a risk of fire or electric shock.
20. Never push objects of any kind into this product through openings, as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
21. The apparatus shall not be exposed to dripping or splashing, and no objects filled with liquids, such as vases, shall be placed on the apparatus.
22. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
23. When replacement parts are required, be sure the service tech-nician has used replacement parts specified by the manufacturer or that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.
24. Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
25. The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

Note to CATV system installer:

This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Figure 1.
Example of Antenna Grounding as per National Electrical Code ANSI/NFPA 70


Antenna Lead-In Wire
Ground Clamp
Antenna Discharge Unit (NEC Section 810-20)
Grounding Conductors (NEC Section 810-21)
Electric Service Equipment
Ground Clamps
Power Service Grounding Electrode System (NEC Art. 250, Part H)

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Deutsch
Wichtige Sicherheitsanweisungen

Heben Sie sich diese Sicherheitsanweisungen auch für später auf.

Befolgen Sie alle auf der Vorrichtung stehenden Anweisungen und Warnungen.

Immer nur mit der richtigen Spannung verwenden! Die Gebrauchsanweisungen des Herstellers informieren Sie über die elektrischen Anforderungen. Vergessen Sie nicht daß bei vershiedenen Betrievsspannungen ggf. auch verschiedene Leitungskabel und/oder Verbindungsstacker zu verwenden sind.

Stellen Sie die Vorrightung nicht in ein unbelüftetes Getell oder unmittelbar über wärmeerzeugende Geräte wie z.B. Tonverstärker. Halten Sie die in den Produktspezifikationen angegebene maximale Umgebungstemperatur bei Betrieb ein.

Schlitze und Öffnungen im GehUause dienen der Belüfung; um verläßlichen Betrieb sicherzustellen und Überheizen zu vermeiden dürfen diese Öffnungen nich verstopft oder abgedeckt werden. Stecken Sie nie irgend einen Gegenstand durch die Belüftungsschlitze. Vergießen Sie keine Flüssigkeiten auf den Apparat.

Dieses Produkt is mit einem 3-drahtigen Erdungsstecher ausgerüstet. Diese Sicherheitsmaßnahme darf nicht unwirksam gemacht werden.

Schließen Sie nie Tonverstärker unmittelbar an einen Anschluß des Apparates an.

Um elektrischen Schlag oder Feuer zu vermeiden, setaen Sie den Apparat weder Regen noch Feuchtigkeit aus und betreiben Sie ihn nicht dort wo Wasser eindringen könnte.

Versuchen Sie nicht den Apparat zu betreiben falls er fallen gelassen, beschädigt, oder Flüssigkeiten ausgesetzt wurde, oder falls sich seine Arbeitsweise derart ändert daß daraus ein Bedarf nach Raparatur zu schließen ist.

Dieser Apparat sollte nur von qualifizierten Fachleuten geöffnet werden. Das Abnehmen von Abdeckungen setzt Sie gefährlichen Spannungen aus.

Dieses Dreick auf ihrem Apparat warnt Sie voe nicht-isolierter, gefährlicher Spannung im Gehäuse…stark genug um eine Berührungsgefahr darzustellen.

Diese Dreick auf ihram Apparat bedeutet daß wichtige Betriebsund Wartungsanweisungen in der mitgelieferten Dokumentation zu finden sind.

Español
Instrucciones importantes de sequirdad

Guarde esta instrucciones para uso posterior.

Utilice siempre el voltaje correcto. Diríjase a las instrucciones de operación del fabricante para obtener las especificaciones de potencia. Esté al tanto de que voltajes de operación distintos requieren el uso de cable y/o enchufes distintos.

No instale esta unidad en un estante sin vntilación, ni tampoco directamente encima de equipose que generen calor tales como amplificadores de potencia. Fíjese en las temperaturas ambientales máximas de operación que se mencionan en las especificaciones del producto.

Las aperturas y ranuras del chasis sirven para proveer la ventilación necesaria para operar la unidad con sequridad y para prevenir sobrecalentamiento, y por lo tanto no pueden ser obstruidas o cubiertas. No introcuzca objetos de ningún tip a través de las ranuras de ventilación, y nunca deje caer ningún líquido sobre la unidad.

Este producto está equipado con un enchufe de 3 clavijas con conexión a ierra. Este es un elemento de seguridad que no debe ser eliminado.

Nunca conecte ningùn tipo de salida de amplificadores de sonido directamente a los conectores de la unidad.

Para prevenir descargas eléctricas o incendios, mantenga la unidad alejada de la lluvia, humedad o cualquier lugar en el que pueda entrar en contacto con ague.

No trate de hacer funcionar la unidad si se ha caído, está dañada, ha entrado en contacto con líquidos, o si nota cualquir cambio brusco en su funcionamiento que indique la necesidad de hacerle un servicio de mantenimiento.

Esta unidad deberá ser abierta únicamente por personal calificado. Si usted quita las coberturas se expondrá a voltajes peligrosos.

Este triángulo que apaece en su componente le advierte sobre la existencia dentro del chasis de voltajes peligrosos sin aislantes…voltajes que son lo suficientemente grandes como para causar electrocución.

Este triángulo que aparece en su componente lo alerta sobre las instrucciones de operación y mantenimiento importantes que están en los materiales de lectura que se incluyen.

Français
Instructions de Sûreté Importantes

Gardex ces instructions pour réference future.

Observez toutes les instructions et tous les avertissements marqués sur l'appareil.

Branchez uniguements sur un réseau de tension indiquée. Consultez le manuel d'instruction du fabriquant pour les spécifications de courant. N'oubliez pas que différentes tensions peuvent nécessiter l'utilisation de cables et/ou de fiches deconnexion différents.

N'installez pas l'appareil en un compartiment non-aéré ou directement au-dessus d'équipements générateurs de chaleur, tels qu'amplificateurs de courants, etc. Ne dépassez pas la température ambiante maximale de fonctionnement indiquée dans les spécifications du produit.

Des fentes et ouvertures sont prévues dans le boîtier pour l'aération; Pour assurer le bon fonctionnement et pour prévenir l'échauffement, ces ouvertures ne doivent pas être couvertes ou bloquées. N'insérez pas d'objets dans les fentes d'aération. Empêchez tout liquide de se répandre sur l'appareil.

Ce produit est muni d'une fiche à trois fils pour la mise à terreee. Ceci est une mesure de sécurité et ne doit pas être contrariée.

Ne connectez jamais d'amplificateurs audio directement aux connecteurs de l'appareil.

Pour empêcher les chocs électriques et le danger d'incendie, évitez d'exposer l'appareil à la pluie ou à l'humidté, et ne le mettez pas en marche en un endroit où il serait exposé aux éclaboussures d'eau.

N'essayez pas de faire fonctionner l'appareil s'il est tombé à terre, a été endommangé, exposé à un liquide, ou si vous observez des différences nettes dans son fonctionnement, indiquant la nécessité de réparations.

Cet appareil ne doit être ouvert que par un personnel de service qualifié. En enlevant les couvercles vous vous exposez àdes tensions électriques dangereuses.

Ce triangle, sur votre appaeil vous avertit de la présence de tension dangereuse, non-isolée à l'intérieur du boîtier…une tension suffisante pour représenter un danger d'electrocution.

Ce triangle sur sur votre appareil vous invite de suivre d'importantes instructions d'utillisation et d'entretien dans la documentation livrée avec le produit.

Italiano
Importanti norme di sicurezza

Conservare le presenti norme per l'utilizzo futuro.

Osservare tutte le istruzioni e le avvertenze apposte sull'unita.

Utilizzare esclusivamente con la tensione di rete corretta. Consultare le istruzioni operative fornite dal fabbricante per i dati riguardanti la tensione e l'assorbimento di corrente. Potrebbe essere necessario l'uso di cavi di rete e/o di spine diverse a seconda della tensione utilizzata.

Non installare l'unità in uno scaffale privo di ventilazione oppure direttamente sopra una fonte di calore, come, ad esempio, un amplificatore. Non superare la temperatura ambientale massima di funzionamento riportata nei dati tecnici del prodotto.

Le fessure e le altre aperture nella scatola servono alla ventilazione. Per un funzionamento affidabile, e per evitare un eventuale surriscaldamento, queste aperture non vanno ostruite o coperte in nessun modo. Evitare in tutti i casi di inserire oggetti di qualsiasi genere attraverso le fessure di ventilazione. Non versare mai del liquido di nessun tipo sull'unità.

QUesto pordotto viene fornito con una spina a 3 fili con massa. Tale dispositivo di sicurezza non va leiminato.

Evitare sempre di collegare le uscite dell'amplificatore auio direttamente ai connettori dell'unità.

Per prevenire il pericolo di folgorazione e di incendio non esporre l'unità alla pioggia o ad un'umidtà eccessiva; evitare di adoperare l'unità dove potrebbe entrare in contatto con acqua.

Evitare di adoperare l'unità se la stessa è stata urtata violentemente, se ha subito un danno, se è stata esposta ad un liquido o in caso di un evidente cambiamento dell prestazioni che indichi la necessità di un intervento di assistenza tecnica.

Ogni intervnto sull'unità va esgguito esclusivamente da personale qualificato. La rimozione della copertura comporta l'esposizione al pericolo di folgorazione.

Il present triangolo impresso sul componente avverte della presenza di tensioni pericolose non isolate all'interno della copertura…tali tensioni rappresentano un pericolo di folgorazione

Il presente triangolo imprsso sul componente avverte l'utente della presenza nella documentazione allegata di importanti istruzioni relative al funzionament ed alla manutenzione.

Dansk
Vigtig information om sikkerhed

Gem denne vejledning til senere brug.

Følg all anvisninger og advaresler på apparatet.

Apparatet skal altid tilslttes den korrekte spænding. Der henvises til brugsanvisningen, der indeholder specifikationer for strømforsyning. Der gøres opmærksom på, at ved varierende driftsspændinger kan det blive nødvendigt at bruge andre lednings- og/eller stiktyper.

Apparated må ikke monteres i et kabinet uden ventilation eller lige over andet udstyr, der udvikler varme, f.eks. forstærkere. Den maksimale omgivelsestemperatur ved drift, der står opført i specifikationerne, skal overholdes.

Der er ventilationsåbninger i kainettet. For at sikre apparatets drift og hindre overophidning må disse åbninger ikke blokeres elle tildækkes. Stik aldrig noget ind igennem ventilationsåbningerne, og pas på aldrig at spilde nogen form for væske på apparatet.

Dette apparat er forsynet med et stik med jordforbindelse. Denne sikkerhedsforanstaltning må aldrig omgås.

Udgangsstik fra audioforstærkere må aldrig sættes direkte i appararet.

Apparatet må ikke udsættes for regn eller fugt og må ikke bruges i nærheden af vand for at undgå risiko for elektrisk stød og brand.

Apparatet må aldrig bruges, hvis det er blevet stødt, beskadiget eller vadt, eller hvis ændringer i ydelsen typer på, at det trænger til eftersyn.

Fette apparat må kun åbnes af fagfolk, Hvis dækslet tages af, udsættes man for livsfarlig højspænding.

Denne mærkat på komponenten advarer om uisoleret, farlig spænding i apparatet… høj nok til at give elektrisk stød.

Denne mærkat på komponenten advarer om vigtig driftsog vedligeholdsinformation i den tilhørende litteratur.

Suomi
Tärkeitä varten

Säilytä nämä ohjeet tulevaa käyttöä varten.

Seuraa kaikkia yksikköön merkittyjä ohjeita ja varoituksia.

Käytä aina oikeaa verkkojännitettä. Tehovaatimukset selviävät valmistajan käyttöohjjeista. Huomaa, että eri käyttöjännitteet saattavat vaatia toisenlaisen verkkojohdon ja/tai- pistokkeen käytön.

Älä asenna yksikköä telineeseen jossa ei ole tuulet usta, tai välittömästi lämpöä tuottavien laitteiden, esim. tehovahvistimien, yläpuolelle. Ympäristön lämpötila käytössä ei saa ylittää twotespesifikaation maksimilämpötilaa.

Kotelo on varustettu tuuletusreiillä ja -aukiooa. Luotettavan toiminnan varmistamiksi ja ylilämiseksi näitä aukkoja ei saa sulkea tai peittää. Mitään esineitä ei saa työntää tuuletusaukkoihin. Mitään nestritä ei saa kaataa yksikköön.

Tuote on varustettu 3-jjohtimisella maadoitetulla verkkipistokkeella. Tämä on turvallisuustoiminne eikä sitä saa poistaa.

Älä kytke audiotehovahvistimen lähtöjä suoraan mihinkään yksikön liittimeen.

Sähköiskun ja palovaaran välttämiseksi yksikkö ei saa olla sateessa tai kosteassa, eikä sitä saa käyttää märässä ympäristössa.

Älä käytä yksikköä jos se on pudonnut, vaurioitunut, kostunut, tai jos sen suorituskkyky on huomattavasti muuttunut, maikä vaatii huoltoa.

Yksikön saa avata vain laitteeseen perehtynyt huoltohenkilö. Kansien poisto altistaa sinut vaarallisille jännittelille.

Tämä kolmio, joka esiintyy homponentissasi, varoittaa siua eristämättömän vaarallisen jännitteen esiintymisestä yksikön sisällä. Tämä jännite saattaa olla riittävä korkea aiheuttamaan sähköiskuvaaran.

Tämä koimio, joka esiintyy komponentissasi, kertoo sinulle, että tässä tuotedokumentoinnissa esiintyy tärkeitä käyttö-ja ylläpite-ohjeita.

Norsk
Viktig informasjon om sikkerhet

Ta vare pådenne veiledningen for senere bruk.

Følg alle anvisningene og advarslene som er angitt på apparatet.

Apparatet skal alltid anvendes med korrekt spenning.

Produktbeskrivelsen inneholder spesifikasjoner for strømkraav. Vær oppmerksom på at det ved ulike driftsspenninger kan være nødvendig å bruke en annen ledningog/eller støpseltype.

Apparatet skai ikke monteres i skap uten ventilasjon, eller direkte over varmeproduserende utstyr, som for eksempel kraftforsterkere. Den maksimale romtemperaturen som står oppgitt i produktbeskrivelsen, skal overholdes.

Apparatet er utstyrt med ventilasjonsåpninger. For at apparatet skal være pålitelig i bruk og ikke overopphetes, må disse åpningene ikke blikkeres eller tildekkes. Stikk aldri noe inn i ventilasjonsåpningene, og pass på at det aldri søles noen form for væske på apparatet.

Dette apparatet er utstyrt med et jordet støpsel. Dette er en sikkerhetsforanstaltning som ikke må forandres.

Utgangsplugger fra audioforsterkere skai aldri koples direkte til apparatet.

Unngå brannfare og elektrisk støt ved å sørge for at apparatet ikke utsettes for regn eller fuktighet og ikke anvendes i næheten an vann.

Apparatet skal ikke brukes hvis det har blitt utsatt for støt, er skadet eller blitt vått, eller hvis endringer i ytelsen tyder på at det trenger service.

Dette apparatet skal kun åpnes av fagfolk. Hvis dekselet fjernes, utsettes man for livsfarlig høyspenning.

Komponenten er merket med denne trekanten, som er en advarsel om at det finnes uisolert, farlig spenning inne i kabinettet…høy nok til å utgjøre en fare for elektrisk støt.

Komponenten er merket med denne trkanten, som betyr at den tilhørende litteraturen inneholder viktige opplysninger om drift og vedikehold.

Svenska
Viktiga säkerhetsföreskrifter

Spara dess föreskrifter för framtida bruk.

Följ alla anvisningar och varningar som anges på engeten.

Använd alltid rätt nätspänning. Se tillverkarens bruksanvisningar för information om effektkrav. Märkväl, att andra matningsspänningar eventuellt kräver att en annan typs nätsladd och/eller kontakt anänds.

Installera inte enheten i ett oventilerat stativ, eller direkt ovanför utrustningar som avger värme, t ex effektförstärkare. Se till att omgivningens temperatur vid drift inte överskrider det angivna värdet i produktspecifikationen.

Behållaren är försedd med hål och öppningar för ventilering. För att garantera tillförlitlig funktion och förhindra överhettning får dessa oppningar inte blockeras eller täckas. Inga föremål får skuffas in genom ventilationshålen. Inga vätskor får spillas på enheten.

Produkten är försedd med en jordad 3-trådskontakt. Detta ä en säkerhetsfunktion som inte får tas ur bruk.

Anslut aldrig audioeffektförstärkarutgångar direkt till någon av enhetens kontakter.

För att undvika elstöt eller brandfara får eenheten inte utsättas för reegn eller fukt, eller användas på ställen där den blir våt.

Använd inte enheten om den far fallit i golbet, skadats, blivit våt, eller om dess prestanda förändrats märkbart, vilket kräver service.

Enheten får öppnas endast av behörig servicepersonal. Farliga spänningar blir tillgängliga när locken tas bort.

Denna triangel, som visas på din komponent, varnar dig om en oisolerad farlig spänning inne i engeten. Denna spänning är eventuellt så hög att fara för elstöt föreligger.

Denna triangel, som visas på din komponent, anger att viktiga bruksanvisningar och servideanvisningar ingår i dokumentationen i fråga.

INTRODUCTION
AND FEATURES
2.0

Introduction

Congratulations on your purchase of this JBL Synthesis S5160 power amplifier! You have purchased a product that embodies the best of what JBL has learned about the emotional power of audio reproduction in over fifty years of preeminence in the field. This amplifier has been designed and crafted to provide the user with a high level of sonic performance; special attention has been paid to minimize the number of components in the audio signal path, resulting in extremely low distortion, excellent transient response, and wide dynamic range. Synthesis products set new benchmarks in audio technology, and, when used as part of a complete JBL Synthesis System, will bring the ambience and acoustics of some of the world's greatest concert halls and theaters into your home.

To obtain the best performance from this amplifier, please be sure to completely read this user's manual and use the S5160 only in accordance with its instructions.

Features

The JBL Synthesis S5160 power amplifier features the following:

THX® Ultra Specifications

This amplifier meets or exceeds the stringent specifications set by the THX Ltd. Audio division in their specifications for "Ultra"-class certification, including power handling, total harmonic distortion, frequency response, signal to noise ratio, slew rate, and crosstalk. When incorporated into a complete THX system, you will hear in your home what the director and sound engineer heard in the recording studio.

Full Five Channel Operation

The S5160 has been designed to integrate well into the world of multi-channel audio. It is designed to reproduce the front left and right, center and side channels, to produce a truly enveloping sound field. When coupled with a high quality subwoofer amplifier, such as the Synthesis S800, it is a solid foundation on which to build a high-performance home cinema system that will astound the listener with its power and realism. The S5160 is specially designed for use with a Synthesis One system in which the front left, right and center speakers are bi-amplified for smoother and more accurate reproduction of every nuance of a movie soundtrack or musical selection. Two S5160 amplifiers may be used, in conjunction with 2 S800 subwoofer amplifiers, to power a complete 7.1-channel home theater system. Alternatively, a single S5160 may be used with one S800 subwoofer amplifier to power a 5.1-channel system.

High Power Capability

The S5160 provides a satisfying 160 watts per channel of distortion-free audio (<0.03% THD) into eight ohms. Because of their power capabilities, all Synthesis amplifiers have an extremely wide dynamic range, an element critical to realistic home cinema. Sound levels equal to those at original performances are easily recreated in even the largest of home listening environments.

Auto Turn-On and Power Sequencing Circuitry

When used in a JBL Synthesis System, the S5160 can be turned on automatically whenever the surround processor is activated. No longer do you have to get out of that chair to turn on the various pieces of equipment in your entertainment system; just one touch on the remote control of the surround processor, and you're a few seconds away from a truly impressive audio presentation!

Modern amplifiers produce more power per channel (and frequently have more channels) than those of the traditional two-channel stereo era. Due to the high current demands of power amplifiers at the instant of turn-on, the S5160, S7150, and S800 amplifiers and the SDEC digital equalizer are equipped with power sequencing circuits which turn on each unit in sequence, avoiding the large instantaneous current demand (and possible house circuit breaker tripping) that would occur should they all turn on at the same instant.

INTRODUCTION
AND FEATURES
2.0

Quiet Cooling

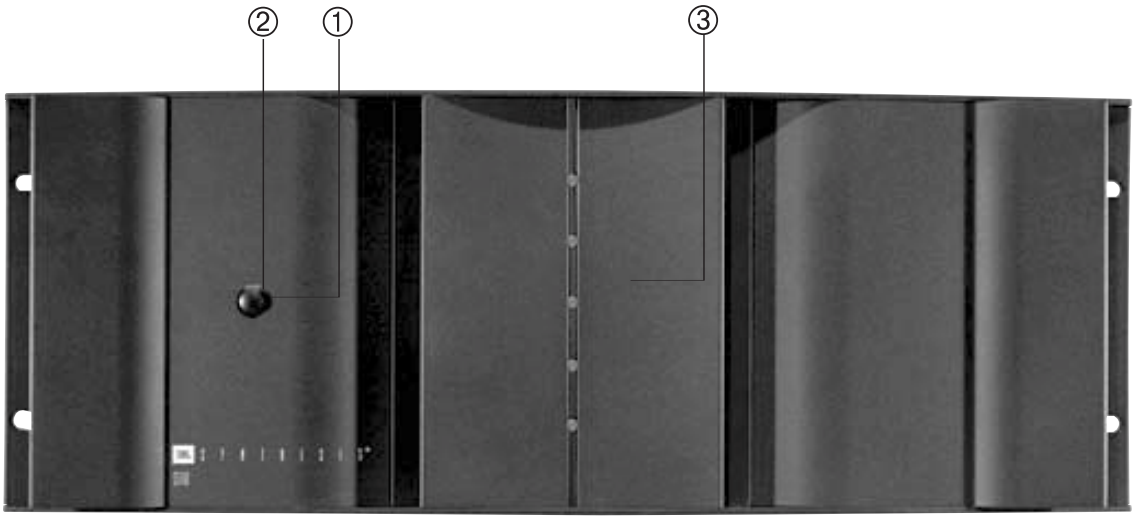
The S5160 utilizes a fan to cool the amplifier channels, ensuring long-term reliability. To reduce fan noise to an absolute minimum, a thermal sensing and control circuit has been incorporated in the Synthesis S5160 that senses increases in temperature within the amplifier and powers a fan at a speed proportional to that temperature increase. When the S5160 is used at lower volume levels, the fan turns very slowly – and quietly. At high listening levels (and the higher operating temperatures this creates within any amplifier), the sensing circuitry causes the fan to turn faster, producing increased cooling. As a result, the fan is never turning faster than necessary, and most of the noise that is generated is masked by the program being listened to.

Comprehensive and Isolated Circuit Protection

The S5160 amplifier employs a sophisticated protective circuit (one for each channel) that senses many possible fault conditions, such as shorted loudspeaker wires or excess power demand, and turns the affected channel(s) and their blue front panel indicators off until the fault condition is removed, at which time normal operation is automatically restored. While protection of this sort is not uncommon in today's well-designed amplifiers, a remarkable feature of the Synthesis S5160's protective circuits is that they are optically-coupled to the signal circuit; there is no direct electrical connection between the signal path and the protective circuitry.

As a result, there can be no coloration of the music, no interaction between protection and amplification, until certain thresholds are exceeded, at which point the channel(s) turn off completely.

3.0
OPERATION AND CONTROLS



3.1 S5160

1. Power Switch

Pushing this button is all that is required to turn on the S5160 if it is not part of a Synthesis system and the ***Manual On/Auto On*** *switch ❼ (rear panel) is in the* ***Manual On*** *position. If the amplifier is used as part of a JBL Synthesis System, and the* ***Manual On/Auto On*** *switch ❼ is in the* ***Auto On*** *position, the amplifier will turn on when the surround processor is activated. The front panel pushbutton power switch is left in the* ***ON*** *(in) position. See the description of the* ***Manual On/Auto On*** *switch ❼ for more information on turning on the S5160.*

2. Standby Indicator (red)

This indicator, immediately above the front panel power switch, will glow red when the amplifier is in the "standby" mode, whether operating as part of a Synthesis system or not. When the S5160 is in the "operate" mode, this light will shut off and the blue "operate" mode indicators will light..

3. Power Indicators (blue)

These indicators will light up when the power amplifier is in the "operate" mode. Each monitors the operation of one channel, and will extinguish if that channel's protective circuit is activated.

4. Input Jacks (Ch.1 thru Ch.5)

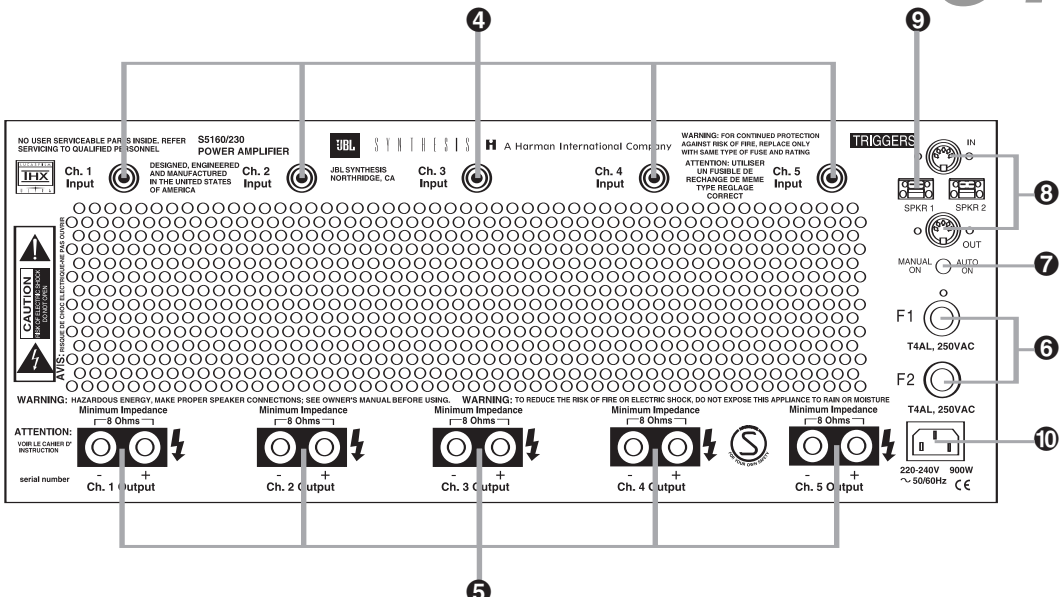
The output signals from the Synthesis digital processor and equalizer are connected to the input jacks in a Synthesis one System. We suggest the channels be assigned as follows:

Amplifier #1:

Channel 1	*Center Low-Frequency*
Channel 2	*Center High-Frequency*
Channel 3	*Right Front Low-Frequency*
Channel 4	*Right Front High-Frequency*
Channel 5	*Right Rear Surround*

Amplifier #2:

Channel 1	*Right Side Surround*
Channel 2	*Left Side Surround*
Channel 3	*Left Front Low-Frequency*
Channel 4	*Left Front High-Frequency*
Channel 5	*Left Rear Surround*



S5160/230

5. Speaker Terminals

Connect the speakers to these terminals, following the normal convention; wire the "+" side of the speaker to the red terminal, and the "–" side to the black terminal. Wire the speakers with the proper polarity; reversing any speaker's connections will not damage either the speaker or the amplifier, but will result in poor low frequency performance and imprecise imaging.

WARNING: Terminals marked with the flash symbol are hazardous when live. External wiring connected to those terminals requires installation by trained personnel, and the use of ready-made lead cords.

***NOTE:** The minimum load impedance that this amplifier can handle safely is eight ohms per channel. Using lower impedance loads can damage the unit and will void your warranty!*

Wire Run Length	Minimum Gauge
Up to 20'	16
Up to 50'	14
Up to 100'	12

6. External Fuses

AC mains fuses are located on the back panel of the amplifier. These fuses will not blow unless the amplifier is asked to produce more power than its design allows for a prolonged period or to prevent excessive current drawn that could damage internal components during a fault condition.

The amplifier has been designed to operate under virtually all conditions. Even momentary short circuiting of the output (speaker) connections will not ordinarily damage the output circuitry (although this will activate internal protective circuitry and cause one or more of the front panel LED indicators to extinguish until the circuit resets.)

Fuse Replacement

To remove the fuse, turn off the power switch and disconnect the power plug from the AC mains. Unscrew the fuse holder cap and remove the fuse, install the new fuse and secure the holder cap and reconnect the AC mains. If after replacing the fuse the unit is inoperative, service is required; contact your JBL Synthesis dealer.

WARNING: Always unplug the amplifier from the AC mains before removing any fuse.

IMPORTANT: Never install a fuse that has a higher rating than that specified on the back panel of the amplifier or in the owners manual.

7. Auto On/ Manual On Switch

*Put this switch in the **Auto On** position if the amplifier is being used as part of a JBL Synthesis System. When used in this way, the S5160 will automatically turn on when the power switch is depressed and the surround processor is activated. For other installations, or should individual control of each component be desired, put this switch in the **Manual On** position. The amplifier will then be controlled solely by the front panel switch.*

8. IN/OUT DIN Jacks

If you are using the amplifier as part of a JBL Synthesis System, it is necessary to use these jacks to interconnect to other system components, so that control signals (power on/off and music/cinema mode switching) can be transmitted from one unit to the next, starting at the surround processor, through the equalizer and amplifiers, and ending at the speakers. Follow the connection diagrams on the following pages for detailed information regarding these connections. Make connections to these jacks only as shown in the diagrams. If these jacks are used in any other manner, e.g., to control electric screens, the unit can be damaged and the warranty will be void. For specific electrical information on these jacks, contact JBL Synthesis Customer Service.

Do not plug anything into these jacks if you are not using the S5160 with a JBL Synthesis System.

9. Speaker Mode Control Connectors

The front left and front right speakers are switched between Music and Cinema modes by signals present at both the DIN connectors (as described in the previous paragraph) AND the 2-conductor connectors shown at ❾.

The installer may find it preferable to use 2-conductor wire (18 gauge recommended) rather than long multi-conductor DIN cables for the mode-switching connection between the S5160 and these two speakers. Adapters supplied with the S5160 are used at the speaker end of the wire to allow connection to the speakers' DIN input connectors. Proper polarity must be observed as shown in the wiring diagrams; reverse the connections at one end of the wire if the speaker(s) do not switch modes (from horn (Cinema) to tweeter (Music)).

Note that 5-conductor DIN cables MUST be used between all other components to allow correct power and mode switching and that the same warning not to plug anything into these jacks, if you are not using the S5160 with a JBL Synthesis System applies here; do not attempt to use these jacks to control anything other than the mode-switching function of Synthesis speakers, as this may damage the S5160 and will void the warranty.

10. AC Inlet

*Your S5160 is shipped with an IEC-type removable power cord that mates with the AC inlet on the rear panel. To ensure proper operation, use the supplied power cord. This amplifier is **NOT a multi-voltage unit**; using a power cord that is not compatible with a 230V, 50Hz AC wall receptacle will void the warranty.*

4.0
INTERCONNECTIONS IN SYNTHESIS SYSTEMS

General Information

A Synthesis One installation utilizing the benefits of bi-amplification of the front speakers incorporates a total of 4 power amplifiers; 2 S5160s, and 2 S800's. Eight of the ten channels on the S5160s are to be used for driving the HI frequency and LO frequency inputs on the left, center, and right speakers, as well as the two side ambient speakers, as indicated in the charts on page 8. Please refer to the connection chart on the following page.

Use the simplified connection diagrams on the following pages to help you understand how to connect the S5160 amplifier to a JBL Synthesis System. These diagrams are intended to show the signal flow through the system. For more detail in making these connections, please refer to the JBL Synthesis Certified Dealer Installation Manual.

Connect DIN and audio cables between system components, as shown on the following pages. Make sure that on all power amplifiers the power switches are in the depressed (ON) position and that the ***Auto On/ Manual On*** *switches* ❼ *are in the* ***Auto On*** *position. Operated in this mode, all of the components will turn on with one touch of the power button on the surround processor's remote control.*

4.1 Synthesis One
Suggested Rack Mounting Order

SDP-40

Top

#1

SDEC-1000A

#2

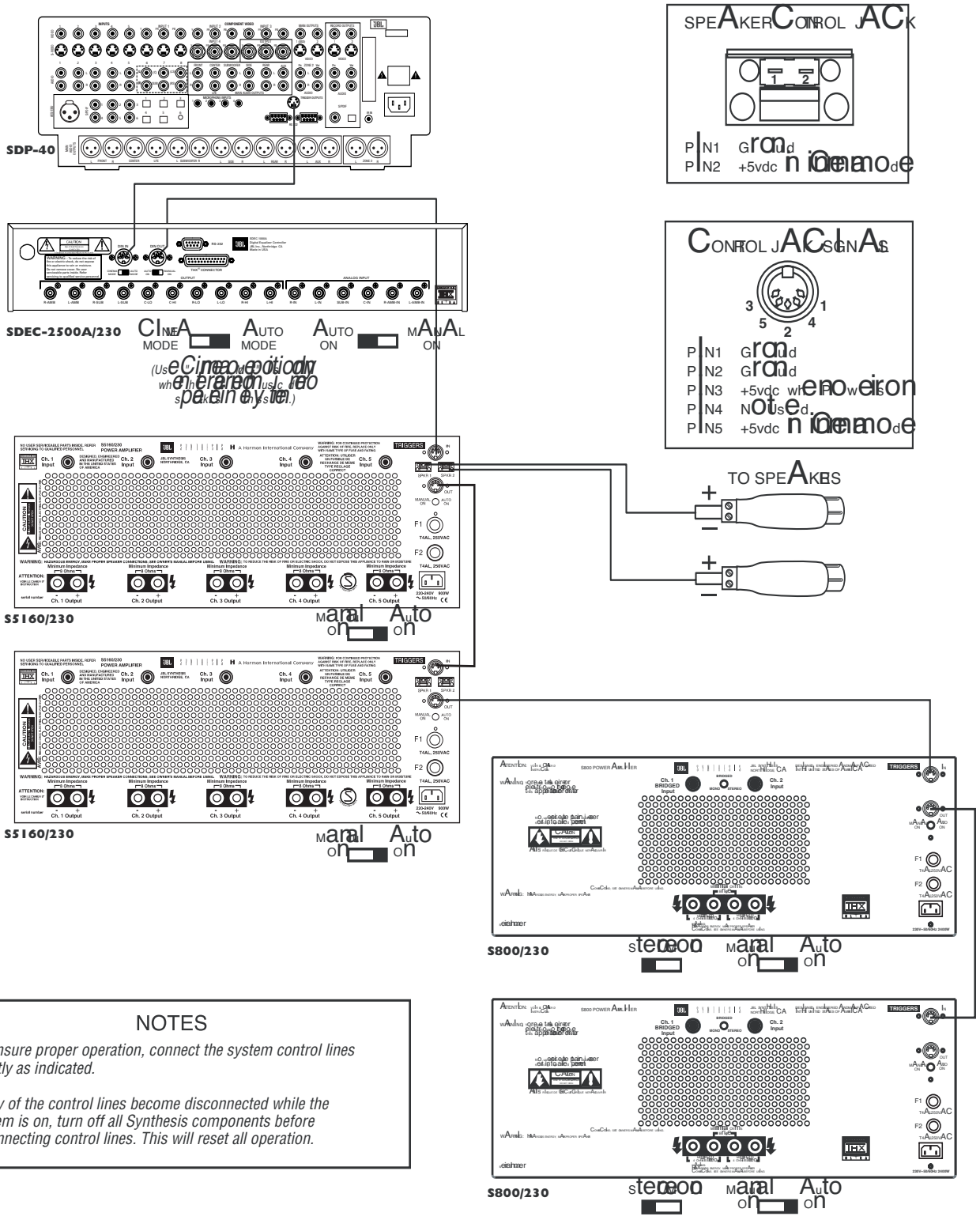
S800/230

#3

S5160/230

#4

4.2 Synthesis One Control Wiring Diagram

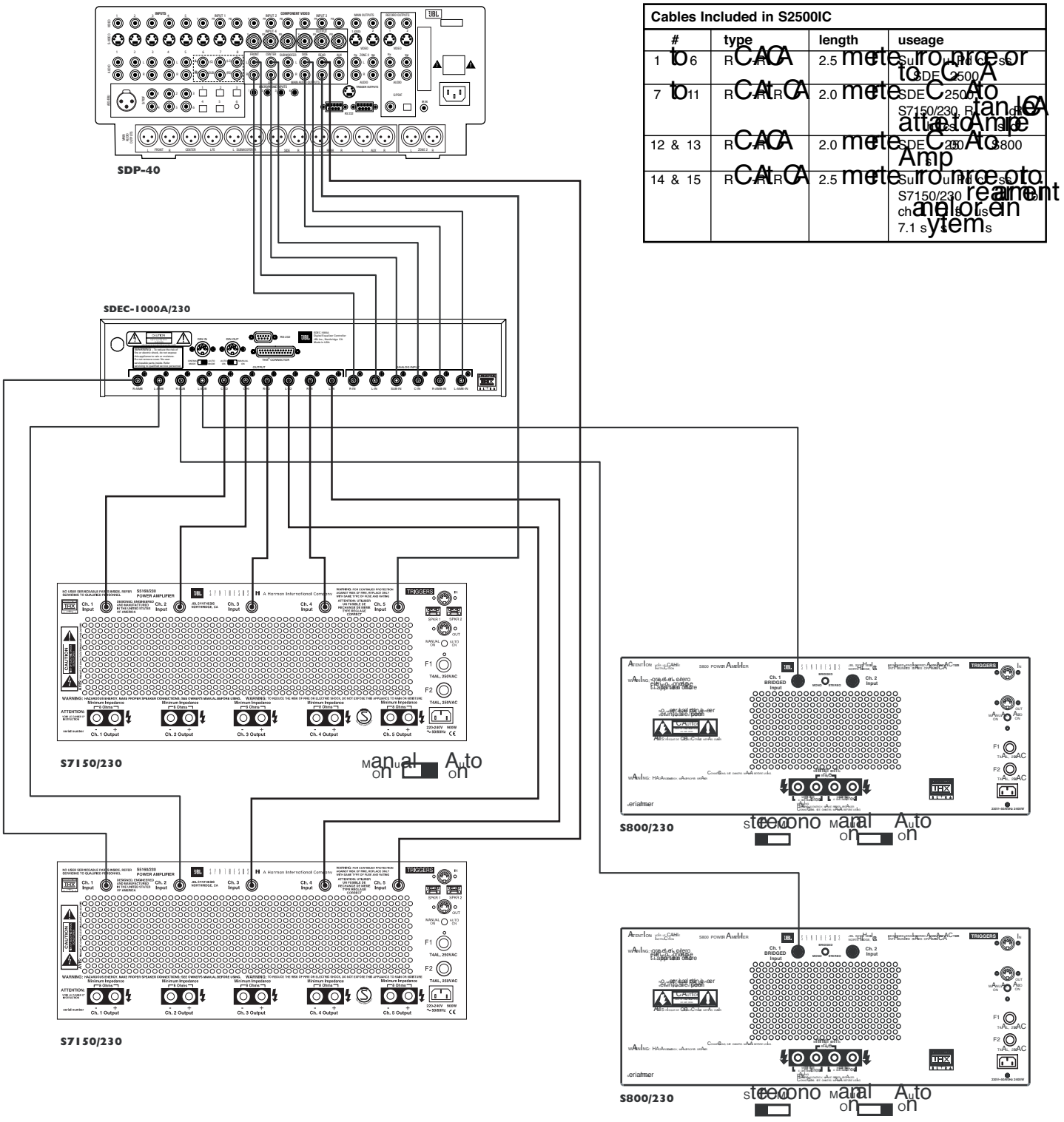


NOTES

1) To ensure proper operation, connect the system control lines exactly as indicated.

2) If any of the control lines become disconnected while the system is on, turn off all Synthesis components before reconnecting control lines. This will reset all operation.

4.3 Synthesis One Interconnection Diagram



Cables Included in S2500IC			
#	type	length	useage
1 to 6	RCA	2.5 meter	Surround Processor to SDEC-2500A
7 to 11	RCA	2.0 meter	SDEC-2500A to S7150/230 Amplifier
12 & 13	RCA	2.0 meter	SDEC-2500A to S800 Amplifier
14 & 15	RCA	2.5 meter	Surround Processor to S7150/230 channels of Synthesis 7.1 system

5.0 PHYSICAL CONSIDERATIONS

Installation of the S5160 is a straightforward process.

IMPORTANT: Amplifier must be installed following the directions described below, to insure adequate performance and safety never install the amplifier with less free spacing around the amplifier than the specified.

1. The Synthesis S5160 power amplifier has been designed to be mounted in EIA standard racks or stacked freestanding as long as there are four inches (10cm) of free spacing around the amplifier (Top, sides and rear) If the S5160 is being mounted in a rack, it is suggested that its feet be removed prior to installation. If the S5160 will be stacked with other components, use the feet that came attached to the unit. This will ensure that there is sufficient air space underneath so that heat can be dissipated effectively.

2. Make sure that the amplifiers are located in a well-ventilated, cool area. Be certain that the front and rear panels are not obstructed, as the cooling fan brings air in from the front and expels it at the rear. It is very important not to obstruct the airflow from the center front panel; heat buildup and premature failure may occur.

6.0 TROUBLESHOOTING

Problem: *Amplifier does not turn on. Neither the red nor blue indicator lights are on.*

Make sure that the amplifier is plugged in, and verify that there is the proper voltage (230V) at the wall outlet.

Problem: *The red indicator lights, but the blue indicators do not light up when the power switch is depressed.*

1. *If the amplifier is being used in a Synthesis system, make sure that the surround processor is turned on, the Auto On/Manual On switch is in the Auto On position, and that all of the necessary DIN cables are connected between the various system components. Refer to the "CONNECTING YOUR SYNTHESIS SYSTEM" section for reference.*
2. *If the amplifier is not being used with a Synthesis system, make sure that the Auto On/Manual On switch is in the Manual On position.*

Problem: *There is no sound from the speakers, but the amplifier is on (blue indicators lit).*

1. *Make sure that the surround processor or equalizer is on, and that the correct source has been connected and selected.*
2. *Make sure that the correct outputs are connected from the surround processor or equalizer to the amplifier.*
3. *Make sure that the speakers are connected to the correct terminals. Check for short circuits at both ends of the speaker cables.*

Problem: *Not all of the amplifiers turn on in a Synthesis system.*

1. *Make sure that all required DIN cables are connected between system components. Refer to the "CONNECTING YOUR SYNTHESIS SYSTEM" section.*
2. *Make sure that each amplifier has its Auto On/Manual On switch in the Auto On position.*

Problem: *Insufficient audio from the speakers.*

Check that the output levels of the surround processor or equalizer are set properly.

Problem: *Insufficient bass.*

Verify that the speakers have been wired to the amplifier with the correct polarity.

Problem: *Front speakers do not switch from music to cinema mode.*

1. *Make sure that the screw terminal and DIN adapter cables to speakers are correctly wired and are connected to the correct jacks on the S5160.*
2. *Make sure that all required DIN cables are connected between system components.*

Problem: *Audible hum from the speakers.*

1. *Check the power outlets and make sure that there is a solid earth ground present. (The services of an electrician may be required.)*
2. *Make sure that all signal cables are routed away from power cords.*
3. *If these suggestions fail, experiment by running ground wires between the rear panel screws of the amplifiers and the other system components, such as the surround processor or signal processing package.*

If you still encounter difficulty after trying the above suggestions, call your JBL Authorized Dealer or visit our website at www.jbl.com for further assistance.

7.0 SPECIFICATIONS

Rated Power Output	*160W per channel into 8 ohms, all channels driven*
THD	*< 0.03% 20Hz - 20kHz*
Input Impedance	*28k ohms*
Sensitivity	*1V in = 28.28V out (THX Level)*
	1.25V in = 150 watts out
Frequency Response (at 1 W)	*20Hz – 20kHz + 0, – 0.25dB*
S/N Ratio (A-weighted at rated power)	**≥** *100dB*
Damping Factor (8 ohms)	**≥≥** *400*
Dynamic Headroom	*5Hz – 100kHz + 0, – 3dB*
IM Distortion	**≤** *0.03%*
Unit Size	*178 mm (H) x 484 mm (W) x 495 mm (D) – 7" H x 19" W x 19½" D*
Unit Weight	*44 kg – 97 lbs*
Shipping Weight	*50 kg – 111 lbs*
All features and specifications are subject to change without notice.	

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